Seismically Actuated Shut off Devices, Lessons Learned

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The Tru-Waste Facility at the Los Alamos National Laboratory is using a seismically actuated electrical shut-off device as part of its seismic safety strategy. The safety function of the device is to cut-off power to critical electrical busses in order to minimize the likelihood of fire following earthquakes by reducing the change for electrical shorts. ASCE 25-06, "Earthquake-Actuated Automatic Gas Shutoff Devices," is an ASCE standard that is frequently used to qualify gas shutoff devices. The testing criteria in ASCE 25-06 sets must actuate and must-not actuate levels that are tied to spectral acceleration levels at 1 Hz, 2.5 Hz, 5 Hz, and 7.7 Hz. These criteria may not be appropriate for use in broadband instruments. IEEE 344-2016 is also frequently used to seismically qualify equipment to ensure ruggedness of equipment up to a specified test response spectra level, however, IEEE 344 does not specify functionality requirements at lower levels of shaking. This paper will present lessons learned and challenges that were observed during the acceptance testing of the seismically actuated shut off device used at the Tru-Waste Facility. Recommendations on acceptance testing of other devices will be presented. Finally, the paper will briefly review the number of seismically actuated devices in placed at other nuclear and the qualification methods used in their acceptance testing.